

Field identification of the *Platevindex* mangrove slugs (Mollusca: Gastropoda: Onchidiidae) of Darwin Harbour

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Abstract

Darwin Harbour supports nine species of mangrove slugs (family Onchidiidae) and currently the names of all them are unknown. It appears that the characters distinguishing the two *Platevindex* species allow animals to be accurately identified in the field on the basis of external characters and on differences in habitat. This note provides descriptions and information on the external characteristics of the two *Platevindex* species.

Mangrove slugs as they are commonly known, comprise a family of shell-less, pulmonate (air-breathing) gastropod molluscs. Members of the Onchidiidae are particularly special ecologically as they constitute one of only four families of gastropods (out of more than 400 families) with species living in marine, brackish, freshwater and terrestrial habitats (Dayrat 2009a). Onchidiid slugs have a wide geographic distribution, but most genera are exclusively found within the tropical and subtropical Indo-West Pacific region (Dayrat 2009b). The Onchidiidae is a poorly-known family with its systematics in a state of confusion (Dayrat 2009b, Dayrat, Zimmermann & Raposa 2011). Animals in this family have been understudied since the last experts specialising in the taxonomy of the family were active more than 70 years ago and there is currently no expert able to reliably identify members of the Onchidiidae (Dayrat 2009a; Benoit Dayrat pers. comm. 2013).

At present, five genera of onchidiids are thought to inhabit the mangroves of Darwin Harbour, only two of which have been assigned names – *Platevindex* and *Peronia* (Benoit Dayrat & Trish Goulding, pers. comm. 2016). Among these genera, nine species have been identified, however none has been formally documented and the nomenclatural status of all of them remains unknown. Hence, scientists dealing with them are required to allocate operational taxonomic units (OTUs, or ‘working names’) to these unnamed species until they are documented by a taxonomic specialist.

This note provides descriptions and information on the external morphological characteristics (i.e. shape, structure, colour and pattern) of the two unnamed species of *Platevindex* – herein referred to as *Platevindex* sp. 1 (blue) and *Platevindex* sp. 2 (orange).

Platevindex is a common tree-climbing genus of onchidiid inhabiting mangrove forests of the Darwin region of the Northern Territory and the two species are frequently encountered on the trunks and branches of mangrove trees during low tides. The genus

is characterised externally by having a noticeably narrower foot than underside of dorsal surface (= hyponotum) (i.e., a ratio of 0.25–0.3 foot width to hyponotal width depending on the degree of body contraction) (see Figs 1, 3), in contrast to other onchidiids.

Field identification of Darwin's *Platevindex* slugs

Most onchidiids cannot be easily identified by non-specialists as few species display distinctive external traits (Dayrat 2010). It is the author's opinion, however, that the unique external features and colouration of Darwin Harbour's two *Platevindex* slugs do allow them to be distinguished and identified accurately to species in the field. The following descriptions of the external characteristics plus photographs of living animals of *Platevindex* sp. 1 (blue) and *Platevindex* sp. 2 (orange) are presented as an aid to distinguishing between them in the field.

The characteristics provided here are based on living adult individuals. Caution must be exercised when identifying juveniles though, as animals may differ in shape, colour and pattern as they mature. Where notable differences in external morphology or colour are evident between adults and juveniles, descriptions and photographs are provided.

Platevindex sp. 1 (blue) (Figs 1, 2)

Description: Size to 43 mm in extended body length (pers. obs.). Body ovate-elongate in shape, juveniles and subadults more circular; distinctively flattened. Notum (= dorsal surface) leathery, either smooth or warty in appearance, always moist to the touch. Photoreceptors (dorsal eyes) single, present almost to edge of notum. Foot sole distinctively narrow. Colour of notum variable, but usually dark grey with lighter grey-brown mottled patches or broken bands, commonly with dark black-grey reticulated mottling around edge; mottling weaker in adults, but conspicuous in juveniles and subadults (Fig. 2). Head, oral lobes and tentacles usually darker than underside of body. Foot sole commonly yellowish to light or dark cream in colour. Hyponotum (= underside



Fig. 1. Dorsal and ventral views of living adult *Platevindex* sp. 1 (blue). The specimen is 40 mm in extended crawling length. (Adam Bourke)



Fig. 2. Subadult *Platevindex* sp. 1 (blue) displaying the distinctive reticulated dark mottling around the edge of the notum. The specimen is 24 mm in extended crawling length. (Adam Bourke)

of dorsal surface) always pale bluish grey colour in adults, *never* with a mottled dark colour radiating outwards from foot sole; juveniles commonly lighter cream in colour.

Remarks on preserved specimens: Disregarding contraction of the body and some loss of colouration, most of the diagnostic features described above are clearly distinguishable for this species in preserved specimens (i.e. those preserved in 70% ethanol). In particular, the lack of dark mottling surrounding the foot sole remains distinct in preserved specimens.

Ecology: This species may occur throughout the entire mangrove forest (pers. obs.), but adults are most commonly encountered on the trunks and branches of trees within forests dominated by Stilt-root Mangrove (*Rhizophora stylosa*) and Pornupan Mangrove (*Sonneratia alba*). Individuals are regularly found feeding on large woody debris in the more seaward mangrove forest zones, but rarely observed on the forest floor (pers. obs.).

Global distribution: The true extent of this species is uncertain. Currently it is only known definitely from Halmahera, the Maluku Islands, Queensland and the Northern Territory (Benoit Dayrat pers. comm. 2016).

Platevindex sp. 2 (orange) (Fig. 3)

Description: Size to 55 mm in extended body length (pers. obs.). Body ovate-elongate in shape, juveniles and subadults more circular; distinctively flattened. Notum (= dorsal surface) leathery, commonly having a very warty appearance resulting from laterally arranged raised bumpy ridges; usually dry to the touch. Foot sole distinctively narrow. Photoreceptors (dorsal eyes) single, never present at edge of notum. Colour of notum dark brown to brown. Head, oral lobes and tentacles rarely darker than underside of body. Foot sole always distinctively orange colour in adults; juveniles commonly pale to dark brown.

Hyponotum (= underside of dorsal surface) yellowish-orange in colour, *always* with a mottled dark colour radiating outwards from foot sole.

Remarks on preserved specimens: Disregarding contraction of the body and some loss of colouration, most of the diagnostic features described above are clearly distinguishable for this species in preserved specimens (i.e. those preserved in 70% ethanol). In particular, the presence of dark mottling radiating outwards from the foot sole is distinctive and remains distinct in preserved specimens.



Fig. 3. Dorsal and ventral views of living adult *Platevindex* sp. 2 (orange). The specimen is 47 mm in extended crawling length. (Adam Bourke)

Ecology: *Platevindex* sp. 2 is restricted to landward mangrove communities dominated by Smooth-fruited Spur Mangrove (*Ceriops australis*) in the upper intertidal (pers. obs.). Individuals are commonly observed feeding on the trunks and buttress roots of *Ceriops australis* trees and after spring high tides and rain, individuals are active on the forest floor (pers. obs.). During the dry season, slugs aestivate in the sediment, taking refuge inside crab burrows and crevices at the bases of trees (pers. obs.).

Global distribution: Philippines, throughout the whole of Malaysia, Northern Territory (Benoît Dayrat pers. comm. 2016).

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